

REMARKS

Claims 1-23 and 25-31 are pending in this application. Claims 1-21 and 27-31 have been withdrawn from consideration. By this Amendment, claims 1-3, 8, 11, 13-15, 17, 19, 22, 23, 30 and 31 are amended. Claim 24 is canceled without prejudice to, or disclaimer of, the subject matter recited therein. Support for the amendments can be found in the specification and the claims as originally filed (see page 11, lines 10-36; and claim 24). No new matter is added.

Entry of the amendments is proper under 37 CFR §1.116 because the amendments:

(a) place the application in condition for allowance (for the reasons discussed herein); (b) do not raise any new issue requiring further search and/or consideration (as the amendments amplify issues previously discussed throughout prosecution); (c) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (d) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

Reconsideration and allowance of the claims are respectfully requested in view of the foregoing amendments and the following remarks.

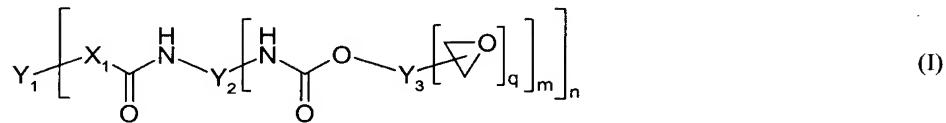
I. Rejection Under 35 U.S.C. §102

The Patent Office rejects claims 22-25 under 35 U.S.C. §102(e) as allegedly being anticipated over U.S. Patent Application Publication No. 2003/0105266 to Suga ("Suga").

Claim 24 is canceled, thus rendering the rejection moot as to that claim. As to the remaining claims, this rejection is respectfully traversed.

Claim 22 recites:

An impact modifier terminated by epoxide groups of the formula (I)



in which:

X_1 is O, S or NH;

Y_1 is a n-valent radical of a reactive polymer after removal of the terminal amino, thiol or hydroxyl groups;

Y_2 is a divalent radical of aliphatic, cycloaliphatic, aromatic or araliphatic diisocyanates after removal of the isocyanate groups or is a trivalent radical of trimers or biurets of aliphatic, cycloaliphatic, aromatic or araliphatic diisocyanates after removal of the isocyanate groups;

Y_3 is a radical of an aliphatic, cycloaliphatic, aromatic or araliphatic epoxide containing a primary or secondary hydroxyl group after removal of the hydroxide and epoxide groups;

q is 2 or 3;

m is 1 or 2;

n is 2, 3 or 4; and

the polymer on which Y_1 in formula (I) is based is a diol or triol having an OH equivalent weight of 600 - 6000 g/mol.

Suga does not disclose each and every feature of claim 22.

The Patent Office alleges that Suga teaches an embodiment for compound (B-1) that does not include a reacted blocking agent (Office Action, page 4). The Patent Office cites to paragraph [0140] of Suga in support of this allegation. For at least the reasons presented below, Applicants respectfully disagree.

Suga describes a resin composition comprising a compound (B). Suga discloses two embodiments relating to compound (B):

1. Compound (B), in which at least **one blocked isocyanate group** and at least one epoxy group are included; or

2. Compound (B) being a mixture of a compound (A) having **two or more blocked isocyanate groups**, and a compound (c) having two or more epoxy groups (Suga, paragraph [0132]).

As shown above, all of the embodiments of Suga's compound (B) contain at least one blocked isocyanate group.

Namely, compound (B) can be obtained from a monomer (B-1) (Suga, paragraph [0133]). With respect to monomer (B-1), Suga discloses that monomer (B-1) is obtained by using a **blocking agent** to block the reaction product between: (1) an epoxy compound having a hydroxyl group; and (2) a polyisocyanate compound (Suga, paragraph [0136]). Although Suga describes how to obtain an unblocked compound of the monomer (B-1) in paragraph [0140], Suga simply describes how an unblocked *intermediate* species can be obtained by adding an excess of the polyisocyanate (a-1), after which the "blocking process can be performed under the [same] conditions" (Suga, paragraph [0140]).

Therefore, a skilled artisan, presented with Suga, would have understood that Suga's compound (B), in any embodiment, contains at least one blocked isocyanate group. The same skilled artisan also would have understood that monomer (B-1) can be "obtained by blocking a reaction product between an epoxy compound having a hydroxyl group and a polyisocyanate compound with a blocking agent," and that Suga merely discloses how to obtain an *intermediate* unblocked species by adding excess polyisocyanate.

The above is consistent with the fact that Suga discloses polyurethane prepolymers represented by an NCO/OH ratio of an isocyanate group of the polyisocyanate compound to a hydroxyl group of the polyol in a range of 1.4 to 3.0, and (Suga, paragraph [0061]). Moreover, the only instance where Suga expressly discloses the presence of an unblocked species is with respect to the compound (A) having **two or more blocked isocyanate groups**.

In this instance, Suga discloses that compound (A) may include an unblocked isocyanate group in addition to two or more blocked isocyanate groups, insofar as it does not negatively affect the objectives of Suga's composition (Suga, paragraph [0072]). Therefore, even in the case where compound (B) is a mixture of a compound (A) having two or more blocked isocyanate groups with a compound (c), even with the presence of an unblocked isocyanate group, compound (A) of Suga (and likewise, compound (B)) remains a compound **having a reacted blocking agent**. Thus, Suga fails to disclose an impact modifier terminated by epoxide groups of the formula (I), in which Y₂ is a divalent radical of aliphatic, cycloaliphatic, aromatic or araliphatic diisocyanates after removal of the isocyanate groups or is a trivalent radical of trimers or biurets of aliphatic, cycloaliphatic, aromatic or araliphatic diisocyanates after removal of the isocyanate groups, as recited in claim 22.

It is well settled that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference. *See MPEP §2131*. Based on the above, Suga fails to disclose each and every feature of claim 22 and, thus, does not anticipate claim 22. Claims 23 and 25 variously depend from claim 22 and, likewise, are also not anticipated by Suga for at least the reasons set forth above with respect to claim 22, as well as for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. Rejection Under 35 U.S.C. §103

The Patent Office rejects claims 22-24 and 26 under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,484,853 to Chen et al. ("Chen") in view of U.S. Patent No. 3,505,283 to Dalhuisen ("Dalhuisen"). Claim 24 is canceled, thus rendering the rejection moot as to that claim. As to the remaining claims, this rejection is respectfully traversed.

The Patent Office alleges that Chen discloses various features of claim 22 (Office Action, page 3). However, the Patent Office concedes that Chen fails to disclose a specific compound that has more than one epoxy group. The Patent Office applies Dalhuisen to allegedly remedy the deficiencies of Chen. However, for at least the reasons presented below, Chen and Dalhuisen would not have rendered obvious each and every feature of claim 22.

Chen describes a two-part adhesive composition with superior thermal resistance, the two parts being (1) a urethane resin composition part, and (2) a polyamine hardener part (Chen, col. 2, lines 1-14). Suitable polyols disclosed by Chen are low molecular weight glycols (*e.g.*, ethylene glycol) or polyesterpolyols with a molecular weight of between 300 to 2000 daltons, which corresponds to a hydroxyl number of 150-1000 g/mol (Chen col. 4, lines 1-5).

Chen is thus directed to a two-component amine/epoxy system having excellent thermal shock resistance, whereas the composition of claim 22 is an impact modifier having superior impact resistance (specification, page 1, lines 6-9). Thermal shock resistance relates to the ability of a composition to withstand deterioration throughout a range of temperature conditions, and is strongly influenced by thermal expansion (Chen, col. 2, lines 9-14). On the other hand, the composition of claim 22 provides superior mechanical impact and crash strength at high and low temperatures (specification, page 19, lines 14-17). Chen does not disclose to one of ordinary skill in the art how to achieve such properties, or that such properties could be achieved with the two-part composition of Chen.

In addition, as described above, Chen discloses the use of low molecular weight polyols having correspondingly low hydroxyl numbers (150-1000 g/mol) and, thus, fails to disclose a two-component epoxy resin adhesive comprising an impact modifier of formula (I), wherein the polymer Y₁ is a diol or triol having an OH equivalent weight of 600-6000 g/mol, as recited in claim 22. Chen further fails to provide any reason or rationale for one of

ordinary skill in the art to have modified the composition of Chen to have included higher molecular weight polymers, without the benefit of Applicants' disclosure. Dalhuisen does not cure the above deficiencies of Chen.

Dalhuisen describes thickening agents for epoxy resins, comprising a hydroxyl containing epoxy polymer, carboxylic acid hardening agents and an isocyanate as a chemical thickening agent (Dalhuisen, col. 1, lines 20-26). Dalhuisen describes aromatic or aliphatic isocyanates with low molecular weights that, although potentially may be able to provide thickening capabilities, would not be able to function as impact tougheners or modifiers, as recited in claim 22 (Dalhuisen, col. 2, lines 61-71). Given the uncertainty of how various chemicals will react with one another, one of ordinary skill in the art would have had no reason or rationale to have combined the epoxy resin of Dalhuisen with the polyurethane polymer of Chen, with any reasonable expectation of success that the resulting composition would have been able to perform as an impact modifier, or even experience a rapid viscosity increase, as alleged by the Patent Office (Office Action, page 3).

Based on the above, Dalhuisen and Chen would not have rendered claim 22 obvious. The remaining claims variously depend from claim 22 and, likewise, would not have been rendered obvious by the applied references for at least the reasons set forth above with respect to claim 22, as well as for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:

Petition for Extension of Time

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